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ABSTRACT

A modified version of the predominant economic impact model (Caffrey-Isaacs) is presented for use by higher education institutions in preparing and carrying out economic impact studies. Use of the modified version allows small institutional research offices to conduct studies in a timely manner with a methodology that remains within the boundaries of the original model and satisfies the political demands inherent when officials request such a study. The report describes the Caffrey-Isaacs model, its modification, and its specific components in detail, with some examples of calculations provided. Survey design and data entry, programming for statistical data analysis, and preparation of the final report are also discussed. Sample printouts are included. (Author/MSE)

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POLITICALLY CORRECT AND EXPEDIENT ECONOMIC IMPACT STUDIES

by

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AASCU/ERIC Model Programs Inventory Project

The AASCU/ERIC Model Programs Inventory is a two-year project seeking to establish and test a model system for collecting and disseminating information on model programs at AASCU-member institutions--375 of the public four-year colleges and universities in the United States.

The four objectives of the project are:

- To increase the information on model programs available to all institutions through the ERIC system
- To encourage the use of the ERIC system by AASCU institutions
- To improve AASCU's ability to know about, and share information on, activities at member institutions, and
- To test a model for collaboration with ERIC that other national organizations might adopt.

The AASCU/ERIC Model Programs Inventory Project is funded with a grant from the Fund for the Improvement of Postsecondary Education to the American Association of State Colleges and Universities, in collaboration with the ERIC Clearinghouse on Higher Education at The George Washington University.

INTRODUCTION

This paper presents a modified version of the Caffrey-Isaacs economic impact model. By use of the modified version, small Institutional Research offices can conduct an economic impact study in a timely manner with a methodology that remains within the boundaries suggested by the Caffrey-Isaacs model; and, satisfies the political demands inherent when officials request such a study. In addition to the modified model, this paper discusses survey design and data entry, SAS programming for data analysis, and preparation of the final report.

PART I - MODIFIED MODEL METHODOLOGY, GENERAL

An institution of higher education impacts its local community in many ways. The institution's primary impact, of course, is providing the opportunity of higher education to community members. In addition, the institution provides local cultural and sporting events. Further, the institution impacts on the community through its public service activities and the public service activities of its staff and faculty.

The impacts discussed above are well known by the institution and the local community. However, a major impact of an institution is not always as well known or understood. This impact is the institution's economic impact on its local community. When considering the economic impact of an institution of higher education, the institution should be viewed as any other business that is a part of the local economy. All businesses create employment and income which have beneficial residual effects throughout the community.

The predominant model used by those conducting economic impact studies continues to be Caffrey-Isaacs[1]. There are no major alternatives to the Caffrey-Isaacs model, or even significant variations[2].

The best simple description of the Caffrey-Isaacs model is found in the AIR (Association for Institutional Research) publication entitled A Primer on Institutional Research:[3].

> "Basically, the Caffrey-Isaacs model attempts to account for the total cash flow into and out of the institution and to calculate the net direct and indirect economic impact on some

1. John Caffrey and Herbert H. Isaacs, Estimating the Impact of a College or University on the Local Economy (Washington, D.C.: American Council on Education, 1972).

2. John a Muffo and Gerald W. McLaughlin, eds., A Primer on Institutional Research (Tallahassee: Association for Institutional Research, 1987), 68.

3. Ibid., 71.

predetermined geographical area, usually a local service district. Sub-models are available to calculate a number of different kinds of impacts, including those affecting local businesses, government, and individuals. These result in 20 different measures of impact on the local economy. The most frequently used sub-models are those related to impact on the business community and the most common measures, additional income and jobs. The model, or variations of it, most frequently used is shown in Figure 1."

Figure 1*

Basic Elements in Determining Economic Impact

College Expenditures	+	Staff Expenditures	+	Student Expenditures
			=	(direct spending)
		DIRECT IMPACT		
TOTAL ECONOMIC IMPACT	=		+	Number of Jobs Due To Existence of College
		INDIRECT IMPACT		
College Related Local Business Volume	+	Income Of Individuals from College Related Business Activity	=	(induced spending)

* AIR, A Primer on Institutional Research, 1987.

Because of the credibility of the Caffrey-Isaacs model and its superb design, it is preferable to use the original model when possible. However, because the full Caffrey-Isaacs model measures both positive and negative economic impacts of higher education institutions in their communities, use of the entire model is labor and time intensive. Indeed, when the full model is used, consulting firms are often hired to assist staff members.

Many small colleges are not in a position to hire consulting firms, and their one-person Institutional Research offices are not in a position to handle the execution of the full model. Nonetheless, these small colleges may have an even more urgent need to demonstrate their economic impact as they compete with larger colleges and universities for state and community support. For these reasons, a modified version of the Caffrey-Isaacs Model was developed and implemented at West Virginia State College.

The modified model does not consider negative economic impacts, such as the local business volume unrealized because of the existence of college enterprises. Campus officials generally have no objection to such a simplification. Also, the modified model does not consider the positive and negative economic impacts on local governments (i.e. college-related revenues received by local governments, real-estate taxes forgone through the tax-exempt status of the college, etc.).

While the modified model measures only positive impacts, these measures are conservative estimates. The same disclaimer that Caffrey and Isaacs made about their model is made for the modified model:

> "Professional economists may well question the simplicity of the approach recommended, and they are entitled to do so. Neither the authors nor the American Council on Education make any claim to theoretical purity or completeness in the methods proposed. They are intended only to provide explicit, reasonable, straightforward procedures for estimating the more direct economic impacts of an institution of higher education on its neighboring community. If anything, these procedures tend to underestimate the positive effects.
>
> In addition to the numbers that may result from the use of these procedures, there is a basic value in simply drawing attention to some of the factors and sums taken into account-many of which are often overlooked by citizens of the community or by the college or university itself. The process of the study may well be more valuable than its final numerical results."[4]

Model and Sub-model Components:

The modified economic impact model is composed of two major sub-models, the local individuals sub-model and the local business sub-model (see figure 2). The nomenclature of the model is designed to provide a consistent numbering framework to assist in relating the various models and sub-models. The business sub-models are labeled B. The individual models are labeled I. Tables 1 and 2 summarize the major components of these sub-models.

To avoid accusations of plagiarism, the author points out that much of the model and submodel discussion was summarized or extracted from Caffrey and Isaac's Estimating the Impact of a College or University on the Local Economy.[5]

4. Caffrey, 2.

5. Caffrey.

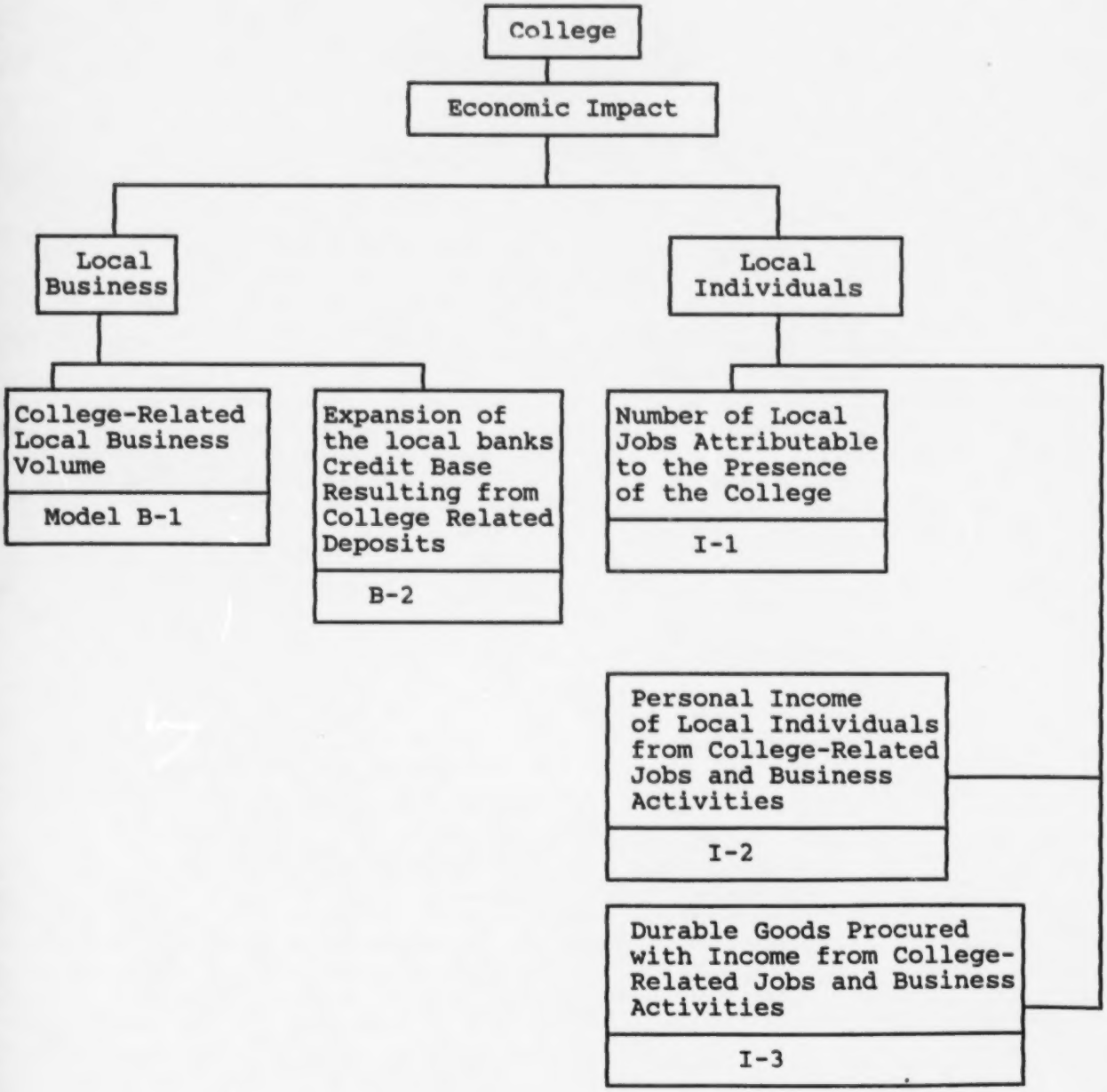

College
Economic Impact
Local Business
Local Individuals
College-Related Local Business Volume
Model B-1
Expansion of the local banks Credit Base Resulting from College Related Deposits
B-2
Number of Local Jobs Attributable to the Presence of the College
I-1
Personal Income of Local Individuals from College-Related Jobs and Business Activities
I-2
Durable Goods Procured with Income from College-Related Jobs and Business Activities
I-3

Figure 2. The economic impact model.

Table I Economic Impacts on Local Business

B-1. College-Related Local Business Volume
- B-1.1. College-Related Local Expenditures
  - B-1.1.1. Local Expenditures by the College
  - B-1.1.2. Local Expenditures by Faculty and Staff
    - B-1.1.2.1. Expenditures by Faculty and Staff for Local Rental Housing
    - B-1.1.2.2. Local Non-housing Expenditures by Local Faculty and Staff
  - B-1.1.3. Local Expenditures by Students
    - B-1.1.3.1. Local Miscellaneous Expenditures, Exclusive of Room and Board, by Students Obtaining Local Room and Board in Group Arrangements or with Parents
    - B-1.1.3.2. Expenditures by Students for Local Rental Housing
    - B-1.1.3.3. Local Nonhousing Expenditures by Students Who Rent Housing
  - B-1.1.4. Local Expenditures by Visitors to the College
- B-1.2. Purchases from Local Sources by Local Businesses in Support of Their College-Related Business Volume
- B-1.3. Local Business Volume Stimulated by the Expenditure of College-Related Income by Local Individuals Other than Faculty, Staff, or Students

B-2. Expansion of the Local Banks' Credit Base Resulting from College-Related Deposits

Table 2 Economic Impacts on Local Individuals

- I-1. Number of Local Jobs Attributable to the Presence of the College
- I-2. Personal Income of Local Individuals from College-Related Jobs and Business Activities
- I-3. Durable Goods Procured with Income from College-Related Jobs and Business Activities

PART II - MODEL AND CALCULATIONS

BUSINESS MODELS

College-Related Local Business Volume

Model B-1 and its component sub-models accumulate the direct purchases from local businesses made by the college and faculty, staff, students, and visitors (B-1.1); the purchases from local sources by local businesses in support of their college-related business volume, or "second-round" purchases (B-1.2); and the amount of local business volume stimulated by the expenditure of college-related income by local individuals other than faculty, staff, or students (B-1.3). (This last element is one of the multiplier effects).

College-Related Local Expenditures

Model B-1.1 is the dollar value of college-related local direct expenditures. These include expenditures by the college as an institution (B-1.1.1), by faculty and staff (B-1.1.2), by students (B-1.1.3), and by visitors to the college (b-1.1.4).

College Expenditures

Model B-1.1.1 estimates the value of purchases of goods and services by the college from local businesses, only a portion of total college expenditures. The proportion, $(e_L)_c$, is derived from total expenditures, excluding wages and salaries, $W_{F,S}$; various account transfers and internal payments that appear on the books, SF_c; and taxes and other payments to governments, R_c.

Again, in order to arrive at conservative estimates, wages and salaries are not included here but are considered separately below. Accounting entries that charge departments within the college for their share of joint services are not included since they do not represent external purchases. Taxes and other payments to all governments are excluded since, by definition, they are not in the business sector. This model provides a good example of how the models tend to understate the impact of the college upon its environment. In exempting wages and salaries, deductions for pensions and insurance are excluded as well. These, as well as receipts from pension and insurance funds, are not included in any other model, yet they may have some impact on the community.

Faculty and Staff Expenditures

Model B-1.1.2 estimates the dollar volume of local purchases of personal goods and services by college faculty and staff households. Both rental housing and nonhousing expenditures by local residents are considered. Non-rental housing is considered later as part of the value of local real property related to the college. The items added together approximate the dollar value of local expenditures by the faculty and staff of the college.

Understatement is evident again in this model. Owner-occupied dwelling units are not considered. Real property value is considered elsewhere, but model B-1.1.2 excludes such items as payments to real-estate brokers, payment of interest charges on outstanding mortgages to local banks, and payment of insurance premiums on owner-occupied dwelling units. Also avoided is any consideration of imputed rental on houses owned outright by faculty and staff, that is, what the rent might be if the houses were offered in the rental market.

Model B-1

BV_{cr}

College-Related Local Business Volume

$$BV_{CR} = (E_L)_{CR} + (P_{LB})_{CR} + (BV_I)_{CR}$$

$(E_L)_{CR}$ = college-related local expenditures (model B-1.1)

$(P_{LB})_{CR}$ = purchases from local sources by local business in support of their college-related business volume (model B-1.2)

$(BV_I)_{CR}$ = local business volume stimulated by the expenditure of college-related income by local individuals other than faculty, staff, or students (model B-1.3)

Model B-1.1

$(E_L)_{CR}$

College-Related Local Expenditures

$$(E_L)_{CR} = (E_L)_C + (E_L)_F + (E_L)_S + (E_L)_V$$

$(E_L)_C$ = local expenditures by the college (model B-1.1.1)

$(E_L)_F$ = local expenditures by faculty and staff (model B-1.1.2)

$(E_L)_S$ = local expenditures by students (model B-1.1.3)

$(E_L)_V$ = local expenditures by visitors to the college (model B-1.1.4.)

Model B-1.1.1

$(E_L)_C$

Local Expenditures by the College

$$(E_L)_C = (e_L)_C \, (E_C - W_{F,S} - XF_C - R_C)$$

$(e_L)_C$ = proportion of total college expenditures that are local, excluding compensation, internal items, and taxes

E_C = total college expenditures

$W_{F,S}$ = gross compensation to faculty, staff, and students

XF_C = internal account transfers and payments

R_C = taxes and other payments to governments

Model B-1.1.2

$(E_L)_F$

Local Expenditures by Faculty and Staff

$$(E_L)_F = (E_H)_F + (E_{NH})_F$$

$(E_H)_F$ = expenditures by faculty and staff for local rental housing (model B-1.1.2.1)

$(E_{NH})_F$ = local nonhousing expenditures by local faculty and staff (model B-1.1.2.2)

Models B.1.1.2.1 and B-1.1.2.2 measure expenditures-rental housing and nonhousing-of local faculty and staff. These models represent the arithmetic products of the respective terms. Only disposable income is given as a dollar figure; expenditures are listed as percentages. Model B-1.1.2.1 yields a dollar value for the $(E_H)_F$ term in B-1.1.2.

Model B-1.1.2.1

$(E_H)_F$

Expenditures by Faculty and Staff for Local Rental Housing

$$(E_H)_F = (f_L)\ (f_H)\ (DI_F)\ (e_H)$$

f_L = proportion of faculty and staff residing locally

f_H = proportion of local faculty and staff who rent housing

DI_F = total disposable income of faculty and staff

e_H = proportion of a tenant's total expenditures likely to be spent for rental housing

Model B-1.1.2.2

$(E_{NH})_F$

Local Non-housing Expenditures by Local Faculty and Staff

$$(E_{NH})_F = (f_L)\ (e_L)\ (DI_F)\ (e_{NH})_F$$

f_L = proportion of faculty and staff residing locally

e_L = proportion of total nonhousing expenditures that an individual is likely to make in his local environment

DI_F = total disposable income of faculty and staff

$(e_{nh})_F$ = proportion of a consumer's total expenditures spent on nonhousing items

Student Expenditures

Model B-1.1.3 involves three terms that are added to obtain an estimate of the total local expenditures by students. The economic behavior of students varies as widely as their other actions. Before discussing the particular models, it will be helpful to consider categorization of students for the present purpose.

Model B-1.1.3

$(E_L)_S$

Local Expenditures by Students

$$(E_L)_S = (E_M)_S + (E_H)_S + (E_{NH})_S$$

$(E_M)_S$ = local miscellaneous expenditures by students obtaining local room and board from other groups, or parents (model B-1.1.3.1)

$E_H)_S$ = expenditures by students for local rental housing (model B-1.1.3.2)

$(E_{NH})_S$ = local nonhousing expenditures by students who rent local housing (model B-1.1.3.3)

The first category includes students who live in college- or university-operated residences and, therefore, do not purchase housing services in the community. A considerable portion of their food expenditures may be made in contract with residence halls or in payment for meals in college-owned commissaries. Depending on the community in which the college is located, a large portion of student entertainment and incidentals may be purchased from the college itself. In other cases, local merchants may meet many demands by resident students for entertainment, school supplies, clothing, medical services, and other purchasable items.

A second category is composed of those students who live off campus in the community, where housing and other commodities and services are purchased in one of two major forms:

1. Students may reside with their parents, in which case one would not usually expect them to pay for the housing, food, or personal services normally provided in a family household.

2. Students may reside in private quarters, alone, with other students, or in student-run cooperatives.

This partial categorization of student hardly exhausts the possibilities. We may distinguish students according to sex, for example, recognizing that males and females will have different expenditure patterns. We may distinguish between those who are married and those who are single. In each case, we may expect different expenditure patterns. Of particular importance is the distinction between full-time and part-time students. Part-time students, including those who attend extension or evening courses, should not be grouped with full-time students. Consider the man who works in an office and takes an evening course in accounting. Even if the program that he carries is equivalent to a third of a full-time program, it would be inappropriate to consider a third of his expenditures as local purchases of goods and services by a

student of the college. His housing, food, and other normal purchases are not really college related. Accordingly, we have treated part-time students as visitors to the college.

Model B-1.1.3.1 estimates the local expenditures, exclusive of room and board, by students obtaining room and board locally in group living arrangements or parental quarters. To obtain this dollar figure, we multiply the number of such students, S_L, by the estimated average expenditures, exclusive of room and board, that a student is likely to make in his local environment, e_L.

Model B-1.1.3.1

$(E_M)_S$

Local Miscellaneous Expenditures, Exclusive of Room and Board, by students Obtaining Local Room and Board in Group Arrangements or with Parents

$$(E_M)_S = (S_L)\ (E_M)_S\ (e_L)$$

S_L = number of students obtaining local room and board from other groups, or parents

$(E_M)_S$ = average miscellaneous expenditures, exclusive of room and board, per student of this type

e_L = proportion of total expenditures, exclusive of room and board, that a student is likely to make in his local environment

Model B-1.1.3.2 depicts expenditures by students for local rental housing. To obtain this figure, the number of students renting local housing. S_H, is multiplied by the average rental housing expenditure per student, $(E_h)_S$.

Model B-1.1.3.3 defines local nonhousing expenditures by students who rent local housing. The number of students renting local housing, S_H, is multiplied by the average nonhousing expenditures per student, $(E_{nh})_S$ and the resulting figure is multiplied by the proportion of expenditures an individual is likely to make in his local environment, e_L.

Model B-1.1.3.2

$(E_H)_S$

Expenditures by Students for Local Rental Housing

$$(E_H)_S = (S_H)\ (E_h)_S$$

S_H = number of students renting local housing

$(E_h)_S$ = average rental housing expenditures per student

Model B-1.1.3.3

$(E_{NH})_S$

Local Nonhousing Expenditures by Students Who Rent Local Housing

$$(E_{NH})_S = (S_H)\ (E_{nh})_S\ (e_L)$$

S_H = number of students renting local housing

$(E_{nh})_S$ = average nonhousing expenditures per student

e_L = proportion of total nonhousing expenditures that a student is likely to make in his local environment

Visitor Expenditures

Still more diverse than the students of a college are its visitors. In few cases are careful records kept of the number of visitors or of their activities. One may, however, identify four general types of visitors: (a) the visitor who goes to the college for business reasons (e.g., book salesman, foundation representative, or guest lecturer); (b) the recreational visitor (e.g., one attending a football game, concert, or art exhibit); (c) the educational visitor (e.g., part-time student, conference attendee, or seminar participant); and (d) the personal visitor (e.g., parent, prospective student, friend, or sightseer).

Model B-1.1.4 considers local expenditures by visitors. To obtain this figure, multiply the total number of visitors in a category by the estimated local expenditures for that category.

Model B-1.1.4

$(E_L)_V$

Local Expenditures by Visitors to the College

$$(E_L)_V = (V_1)(E_1)_V + (V_2)(E_2)_V + \ldots + (V_n)(E_n)_V$$

(V_n) = estimated number of visits to the college by visitors in the nth category

$(E_n)_V$ = estimated local expenditures by each visitor in the nth category during each visit to the college

Second-Round Local Expenditures

Models B-1.2 and B-1.3 indicate the additional volume of local business activity resulting from stimuli provided by the purchases of goods and services considered in the other B-1 models. When the college buys from a local supplier or when a visitor eats in a local restaurant, a long train of economic transactions is set off. The initial dollar is re-spent many times; it may reappear as income to residents of the community, as business receipts by other local merchants, or as payment to suppliers outside the community.

Model B-1.2 estimates the volume of purchases by local concerns in support of their college-related business. Thus, the coefficient m_p represents the proportion of receipts from college-related purchases used in turn to purchase goods and services from local sources.

Model B-1.2

$(P_{LB})_{CR}$

Purchases from local Sources by Local Businesses in Support of Their College-Related Business Volume

$$(P_{LB})_{CR} = (m_p)\ (E_L)_{CR}$$

m_p = coefficient representing the degree to which local businesses purchase goods and services from local sources

$(E_L)_{CR}$ = college-related local expenditures (model B-1.1)

This multiplier will tend to be smaller for highly specialized communities and for small communities within large urban areas than for the diversified, large city. How long it takes for the indirect effects to work their way through the economy is not known, but one may expect that the major effects will certainly take place within a year.

Model B-1.3

$(BV_I)_{CR}$

Local Business Volume Stimulated by the Expenditure of College-Related Income by Local Individuals Other Than Faculty, Staff, or Students

$$(BV_I)_{CR} = (m_i)\ (E_L)_{CR}$$

m_i = coefficient representing the degree to which individual income received from local business activity is spent and re-spent locally

$(E_L)_{CR}$ = college-related local expenditures (model B-1.1)

Model B-1.3, the second estimation of indirect effects of college-related business activity in the local community. As noted above, some of the receipts by local businessmen will be paid out to local residents in the form of wages, salaries, and entrepreneurial returns, and a portion of this money will be spend for the everyday purposes of its recipients. The coefficient m_i represents the proportion of income received from local college-related business activity that is spent and re-spent locally.

Expansion of the Local Credit Base

Another secondary effect resulting from the economic activity of the college and of its associated personnel is the expansion of the credit base of local banks resulting from deposits by the college and its personnel and from the business activity they generate. Given the complexities of the banking business and the prevalence of branch banking (which often means that neither all deposits nor all decision-making functions are retained in the community), it is difficult to say how much the credit base of local banks is expanded by these deposits.

We may, however, obtain a minimum estimate, as indicated in model B-2. Assume that the average level of deposits in the time and demand accounts of the college, its faculty, staff, students and of business enterprises[6] can be expanded by one minus the minimum legal reserve requirements. For example, if the minimum reserve requirement is 20 percent-that is, if the bank must hold in reserve against withdrawals from its accounts 20 percent of the amount of those accounts-then 80 percent of the funds may be available for loan. Whether these funds are loaned and to whom they are loaned are not of interest here; the intent is to note the availability of more funds in the local money market.

6. It is assumed that businesses are not likely to hold funds in savings accounts; hence, businesses are considered only in relation to demand deposits.

Model B-2

CB

Expansion of the Local Banks' Credit Base Resulting from College-Related Deposits

$$CB = (1-t)\{TD_c + (TD_f)(F) + (TD_s)(S)\} + (1-d)\{DD_c + (DD_f)(F) + (DD_s)(S) + (cbv)(BV_{CR})\}$$

t	=	local time-deposit reserve requirement
TD_c	=	average time deposit of the college in local banks
TD_f	=	average time deposit of each faculty and staff person in local banks
F	=	total number of faculty and staff
TD_s	=	average time deposit of each student in local banks
S	=	total number of students
d	=	local demand-deposit reserve requirement
DD_c	=	average demand-deposit of the college in local banks
DD_f	=	average demand deposit of each faculty and staff person in local banks
DD_s	=	average demand deposit of each student in local banks
cbv	=	cash-to-business-volume ratio
BV_{CR}	=	college-related local business volume (model B-1)

EXAMPLES OF BUSINESS MODEL CALCULATIONS

Examples of the business model calculations below were taken from the West Virginia State College economic impact study. These examples indicate the source of the information necessary to perform the calculations.

Model B-1.1.1

$(E_L)_C$

Local Expenditures by the College

$(e_L)_C$ = proportion of total college expenditures excluding compensation, internal items and taxes that were local. = 0.6505

The Computer Center analyzed three years worth of vendor invoices. $16,438,869 of $25,270,708 were local expenditures. Therefore, the expected value for the proportion of local expenditures is 65.05% (or 0.6505).

E_C = total college expenditures = $12,601,305

$W_{F,S}$ = gross compensation to faculty, staff and students = $8,669,867

XF_C = internal account transfers and payments = 0

R_C = taxes and other payments to governments

= $235,063 state taxes + $951,886 federal taxes

\+ $100,940 social security match

\+ $57,282 public employees insurance

\+ $5,965 unemployment compensation tax

= $1,351,136

$(E_L)_C = (e_L)_C (E_C - W_{F,S} - XF_C - R_C)$

= (0.6505) ($12,601,305 - $8,669,867 - 0 - $1,351,136)

= $1,678,486

Model B-1.1.2.1

$(E_H)_F$

Expenditures by Faculty and Staff for Local Rental Housing

f_L = proportion of faculty and staff that reside locally = 0.9794

In '87-'88 the staff and faculty population totalled 419. Ninety-seven responded to the Economic Impact Survey. Of the 97 respondents, 95 resided locally. Therefore, the proportion of staff and faculty that reside locally is estimated at 95/97 = 0.9794

F_H = proportion of local faculty and staff who rent housing. = 0.2814

Also based on the survey results, 24 of the 97 staff and faculty members residing locally rent housing. The proportion renting then is 24/97 = 0.2474.

DI_F = total disposable income of faculty and staff = $11,469,287

From the survey results, the mean annual income, after deductions of staff and faculty, was $27,373. This multiplied by the total staff and faculty population, 419, gives an estimated total disposable income of $11,469,287. Note that this DI_F includes income of other family members or other sources than the college.

e_H = proportion of a tenants total income likely to be spent on rent = 0.2232

From survey results

$$\frac{\text{average annual expenditure for rent}}{\text{average income after deductions for those S/F that rent}} = \frac{4,344}{19,460} = 0.2232$$

$(E_H)_F = (f_L)\ (f_H)\ (DI_f)\ (e_H)$

$= (0.9794)\ (0.2814)\ ($11,469,287)\ (0.2232)$

= $705,529 annually

Model B-1.1.2.2

$(E_{NH})_F$

Local Non-housing Expenditures by Local Faculty and Staff

f_L = proportion of faculty and staff residing locally = 0.9794

e_L = proportion of total non-housing expenditures that a staff or faculty member is likely to make in the local environment = 0.8761

According to survey results, the average staff/faculty member spent $815 monthly for food and all other non-housing expenditures with an average of $714 of that amount being spend locally.

Then e_L is estimated by $\frac{714}{815} = 0.8761$

DI_F = total disposable income of faculty and staff (for calculation see model B.1.1.2.1) = $11,469,287

$(e_{nh})_F$ = proportion of a consumers' total expenditures spent on non-housing items = 0.6562

$$\frac{\text{average expenditures of staff and faculty members on non-housing}}{\text{average total expenditures of staff and faculty members}} = \frac{\$815}{\$1,242} = 0.6562$$

$(E_{NH})_F = (f_L)\ (e_L)\ DI_F\ (e_{NH})_F$

$= (0.9794)\ (0.8761)\ ($11,469,287)\ (0.6562)$

$= \$6,457,827$

Model B-1.1.2

$(E_L)_F$

Local Expenditures by Faculty and Staff

$(E_H)_F$ = expenditures by faculty and staff for local rental housing (model B-1.1.2.1)

= $705,529

$(E_{NH})_F$ = local non-housing expenditures by local faculty and staff (model B-1.1.2.2)

= $6,457,827

$(E_L)_F = (E_H)_F + (E_{NH})_F$ = $705,529 + $6,457,827

= $7,163,356

Model B-1.1.3.1

$(E_M)_S$

Local Miscellaneous Expenditures, Exclusive of Room and Board, by Students Obtaining Local Room and Board in Group Arrangements with Parents, or in Dorms

S_L = number of students obtaining local room and board from other groups, or parents = 1,239

According to survey results 8 lived in dorms, one student rented with other students and 47 lived with their parents. (Note, the 56 are full-time students. Part-time students are treated as visitors to the college). Of the 198 students that responded to the survey, 106 were full time.

The proportion of full-time students living with their parents or with other student groups or in dorms is calculated by

$$\frac{56}{106} \quad X \quad 2,346 \quad = \quad 1,239$$

where 2,346 is the number of full-time students in the Fall of 1987.

$(E_m)_S$ = average miscellaneous expenditures, exclusive of room and board, per student of this type = $1,476 annually (2 semesters)

Survey analysis shows this mean to be $164 monthly. It is assumed that students will attend 9 months, a conservative estimate. 9 x $164 = $1,476

e_L' = proportion of total expenditures, that a student of this type is likely to make in his environment = 1

The average local expenditure for a student of this type was calculated from survey results to be $208. This amount divided by total average monthly expenditures of $208 gives an e_L' of 1.

$(E_M)_S$ = $(S_L)\ (E_m)_S\ (e_L')$

= 1,239 ($1,476) (1)

= $1,828,764 annually

Model B-1.1.3.2

$(E_H)_s$

Expenditures by Full-Time Students for Local Rental Housing

S_H = number of full-time students renting local housing = 176

According to survey results, 29 of the 106 full-time students that responded rented local housing. This gives a proportion of 29/106 = 0.2736. The proportion multiplied by the number of full-time students gives S_H.

S_H = 0.2736 (2,346) = 176

$(E_h)_s$ = average rental housing expenditures per student = $2,349

From survey results the average monthly rental expenditure was $261. This multiplied by 9 months (2 semesters) gives an annual expenditure of $2,349.

$(E_H)_s$ = (S_H) $(E_h)_s$

= 176 ($2,349)

= $413,424

Model B-1.1.3.3

$(E_{NH})_S$

Local Non-housing Expenditures by Students Who Rent Local Housing

S_H = number of full-time students renting local housing (from model B-1.1.3.2) = 176

$(E_{nh})_s$ = average annual non-housing expenditures per student of this type = $4,950

From survey results, $550 monthly average non-housing expenditure for a student of this type. $550 x 9 months = $4,950 annually.

$e_L"$ = proportion of total non-housing expenditures that a student of this type is likely to make in his local environment.

From survey results, the average student of this type spent $253 locally in a month. This number divided by the average total non-housing expenditure of these students, gives a proportion of

$253/$550 = 0.4600

$(E_{NH})_S$ = $(S_H)\ (E_{nh})_s\ (e_L")$

= (176) ($4,950) (0.4600)

= $400,752

Model B-1.1.3

$(E_L)_S$

Local Expenditures by Students

$(E_M)_S$ = local miscellaneous expenditures by students obtaining room and board in group arrangements (dorm, renting w/other students, living with parents), from B-1.1.3.1

= $1,828,764

$(E_H)_S$ = expenditures by students for local rental housing, from B-1.1.3.2

= $413,424

$(E_{NH})_S$ = local non-housing expenditures by students who rent local housing, from B-1.1.3.3

= $400,752

$(E_L)_S = (E_M)_S + (E_H)_S + (E_{NH})_S$

= $1,828,764 + $413,424 + $400,752

= $2,642,940

Model B-1.1.4

$(E_1)_v$

Local Expenditures by Visitors to the College

(V_n) = estimated number of visitors to the college in the nth category.

$(E_n)_v$ = estimated local expenditures by each visitor in the nth category during visits to the college.

V_1 = part-time students = 2,157 in Fall '88

$(E_1)_v$ = $744

Expenditure	Weekly	X	conservative estimate 36 (2 semesters)
Transportation to college	$10.00		$360
Snacks	$8.00		$288
Paper supplies, typing, copying	$2.00		$72
Parking			$24
	total annual college related expenditures		$744 = $(E_1)_v$

V_2 = homecoming visitors = 250

The Charleston House Holiday Inn was booked to capacity for Homecoming 1987, housing approximately 250 out-of-town homecoming visitors. Each visitor stayed on the average two nights and incurred the following charges.

Room Charges	2 days X $55/day	=	$110
Meals	2 days X $35/day	=	$70
Alcoholic Beverages	2 days X $10/day	=	$20
			$200

$(E_2)_v$ = $200 (see above calculations)

Then

$(E_L)_V$ = $V_1 (E_1)_V + V_2 + (E_2)_V$

= (2,157) ($744) + (250) ($200)

= $1,604,800 + $50,000 = $1,654,800

It should be noted that this estimate excludes many visitors to the college (i.e. visits by parents, visitors for cultural events, visitors for athletic events) and their expenditures. Therefore, the estimate is thought to be very conservative.

Model B-1.1

$(E_L)_{CR}$

College Related Local Expenditures

$(E_L)_C$ = local expenditures by the college (model B-1.1.1)

= $1,678,486

$(E_L)_F$ = local expenditures by faculty and staff (model B-1.1.2)

= $7,163,356

$(E_L)_S$ = local expenditures by students (model B-1.1.3)

= $2,642,940

$(E_L)_V$ = local expenditures by visitors to the college (model B-1.1.4)

= $1,654,800

$(E_L)_{CR}$ = $(E_L)_C + (E_L)_F + (E_L)_S + (EL)_V$

= $1,678,486 + $7,163,356 + $2,642,940 + $1,654,800

= $13,139,582

Model B-1.2

$(P_{LB})_{CR}$

Purchases from Local Sources by Local Businesses in Support of Their College-Related Business Volume

m_p = co-efficient representing the degree to which local businesses purchase goods and services from local sources

= $0.30/$1.00 of expenditures by local resident in local business establishments = 0.3

This multiplier was taken from those suggested by the Caffrey-Isaacs economic impact model (for a region of this study's type) developed for the American Council on Education.

$(E_L)_{Cr}$ = college-related local expenditures (model B-1.1)

= $13,139,582

$(P_{LB})_{CR}$ = $(mp)\ (E_L)_{CR}$ = (0.3) ($13,139,582)

= $3,941,874

Model B-1.3

$(BV_I)_{CR}$

Local Business Volume Stimulated by the Expenditure of College-Related Income by Local Individuals Other Than Faculty, Staff or Students

m_i = coefficient representing the degree to which individual income received from local business activity is spent and re-spent locally

= $0.80/$1.00 of expenditures by local residents in local business establishments

= 0.80

This multiplier was also taken from the Caffrey-Isaacs model (as in model B-1.2).

$(E_L)_{CR}$ = college-related local expenditures (model B-1.1)

= $13,139,582

$(BV_I)_{CR} = (m_i)\ (E_L)_{CR}$

= (0.8) ($13,139,582)

= $10,511,666

Model B-1

BV_{CR}

College-Related Local Business Volume

$(E_L)_{CR}$ = college-related local expenditures (model B-1.1)

= $13,139,582

$(P_{LB})_{CR}$ = purchases from local sources by local business in support of their college-related business volume (model B-1.2)

= $3,941,874

$(BV_I)_{CR}$ = local business volume stimulated by the expenditure of college-related income by local individuals other than faculty, staff, or students (model B-1.3)

= $10,511,666

$BV_{CR} = (E_L)_{CR} + (P_{LB})_{CR} + (BV_I)_{CR}$

= $13,139,582 + $3,941,874 + $10,511,666

= $27,593,122

Model B-2

CB

Expansion of the Local Banks' Credit Base Resulting from College-Related Deposits

t = local time-deposit reserve requirement

= 3%

Source: Mr. Tony Arkesteyn, Assistant Manager of the Accounting Department, Federal Reserve Bank, Richmond, Virginia.

TD_c = average time deposit of the college in local banks

= $497,054 (from the Development Office)

TD_f = average time deposit of each faculty and staff person in local banks

= $3,040 (from survey data)

F = total number of faculty and staff

= 419

TD_s = average time deposit of each student in local banks

= $1,114 (from survey results of full-time students)

S = total number of full-time students ('87-'88)

= 2,346

d = local demand deposit reserve requirement

= 3% (same source as t)

DD_c = average demand deposit of the college in local banks = $283,400

DD_f = average demand deposit of each faculty and staff person in local banks

= $990 (from survey results)

DD_s = average demand deposits of full-time students in local banks = $235 (from survey data)

cbv = cash-to-business-volume ratio

= 0.037 (from Caffrey-Isaacs Model)

BV_{cr} = college-related local business volume (model B-1)

= $27,593,122

$CB = (1-t) [TD_c + (TD_f) (F) + (TD_s) (S)] + (1-d [DD_c + (DD_f) (F) + (DD_s) (S) + (cbv) (BV_{CR})]$

$CB = (1-0.3) [\$497,054 + (\$3,040)(419) + (\$1,114)(2,346)]$

$+ (1-0.3) [\$283,400 + \$990 (419)$

$+ (\$235) (2,346) + (0.037) (\$27,593,122)]$

$CB = (0.7) [\$497,054 + \$1,273,760 + \$2,613,444]$

$+ (0.7) [\$283,400 + \$414,810 + \$551,310 + \$1,020,946]$

$CB = (0.7) [4,384,258] + (0.7) [2,270,466]$

$CB = 3,068,981 + 1,589,326$

$CB = \$4,658,307$

THE INDIVIDUAL MODELS

The third sector of the community influenced by the presence of the college is the individual. Three models emerge in this area: model I-1 deals with the number of local jobs attributable to the presence of the college, model I-2 indicates the personal income of local individuals from college-related jobs and business activities, and model I-3 considers durable goods procured with income from college-related jobs and business activities. These three models result in values that are not additive; that is, the number of jobs cannot be added to personal income, nor can either of these be added to durable goods.

Number of Local Jobs Attributable to the Presence of the College

Model I-1 uses the following logic: if total college-related expenditures (obtained for model B-1.1) are added to the operating costs of government-provided municipal and public school services allocable to college-related influences, the resulting sum will be the total local expenditures that can be associated with the college. If one then multiplies these expenditures by the number of full-time jobs per dollar of direct expenditures in the local environment, j, the number of local jobs created by college-related expenditures is obtained. This figure, added to the number of faculty and staff positions, yields the total number of local jobs attributable to the presence of the college.

It should be noted that it is unnecessary to consider in this model any jobs other than those resulting from first-round, direct expenditures. The multiplier effects are scaled to first-round expenditures and thus account for any impacts-in this case, jobs-that result from second-round and later expenditures.

Model I-1

J_L

Number of Local Jobs Attributable to the Presence of the College

$$J_L = F + (j)\ [E_L)_{CR} + (CG)_{CR}]$$

F = total number of faculty and staff

j = full-time jobs per dollar of direct expenditures in the local environment

$(E_L)_{CR}$ = college-related local expenditures (model B-1.1)

$(CG)_{CR}$ = costs of government-provided services allocable to college related influences

The associated models in I-1.1 are intended to express the annual operating costs of government services that are provided to the college and/or to individuals related to the college.

Costs of government-provided services

Model I-1.1 estimates the cost of government-provided municipal services allocable to college-related influences. If it were possible to separate these services definitively into those that are people-oriented versus those that are property-oriented, allocation could be made on a prorated basis with respect to population in the first case and with respect to either geographic area or value of property in the second. Such a distinction, however, is not easily made, and for the present purpose, population relationships will be emphasized. It is important to recognize that the population basis for allocating costs of services to a college area has the potential of overestimating the costs of services to the college by implicitly underestimating the services rendered to business establishments. Businesses are usually capital intensive, and, because a college is usually labor intensive, the share of government expenditures allocated to it under this technique will probably be higher than it would be for an industrial installation.

Model I-1.1

$(CG)_{CR}$

Costs of Government-Provided Services Allocable to College-Related Influences.

$(CG)_{CR}) = [(HSZ)_{SF} (SF)_{LR} (GE)_{pc}]$

$+ [(HSZ)_{FTS} (FTS)_{LR} (GE)_{pc}]$

$(HSZ)_{SF}$ = average household size of staff and faculty that reside locally

$(SF)_{LR}$ = number of staff and faculty that reside locally

$(HSZ)_{FTS}$ = average household size of local, full-time students who do not live in a group arrangement

$(FTS)_{LR}$ = number of full-time students who do not live in a group arrangements

$(GE)_{pc}$ = per capita state and local direct general expenditures (excluding intergovernmental expenditures)

Personal Income of Local Individuals from College-Related Jobs and Business Activities

Model I-2 expresses the total personal income of local individuals from college-related jobs and business activities. Two types of personal income are considered; the first is that of locally resident faculty and staff. This amount is obtained by multiplying the proportion of faculty and staff who reside locally by the gross compensation of all faculty and staff. Again the assumption is made that those who live in the college community have the same level of income as the average college employee. (Alternatively, one could multiply the total personnel expenditures of the college by the proportion of faculty and staff residing locally.)

The second type of personal income is that related to jobs, other than faculty and staff positions, attributable to the presence of the college. To obtain this figure, college-related expenditures (derived in model B-1.1) are multiplied by the local figure for payrolls and profits per dollar of local direct expenditures. As in model I-1, only local direct expenditures need be considered for p. Payrolls and profits per dollar of second- and later-round expenditures are taken into accoûnt by the multiplier effects.

Model I-2

PI_{CR}

Personal Income of Local Individuals from College-Related Jobs and Business Activities

$$PI_{CR} = (f_L)(W_F) + (p)(E_L)_{CR}$$

f_L = proportion of faculty and staff residing locally (see model B-1.1.2.1)

W_F = gross compensation to faculty and staff

p = payrolls and profits per dollar of local direct expenditures

$(E_L)_{CR}$ = college-related local expenditures (model B-1.1)

Durable Goods Procured with Income from College-Related Jobs and Business Activities

The final model, I-3, indicates durable goods procured with income from college-related jobs and business activities.

The personal income of local individuals from college-related jobs and business activities (derived in model I-2) is multiplied by the proportion of total income typically used to purchase durable goods.

Model I-3

DG_{CR}

Durable Goods Procured with Income from College-Related Jobs and Business Activities

$$DG_{CR} = (i)(PI_{CR})$$

i = proportion of total income typically used to purchase durable goods

PI_{CR} = personal income of local individuals from college-related jobs and business activities (model I-2)

EXAMPLES OF THE INDIVIDUAL MODELS CALCULATIONS

Again, these examples were taken from the West Virginia State College economic impact study and indicate the source of the information necessary to perform the calculations.

Model I-1.1.

$(CG)_{CR}$

Costs of Government-Provided Services Allocable to College-Related Influences

$(HSZ)_{SF}$ = average household size of staff and faculty that reside locally

= 2.5979 (from survey results)

$(SF)_{LR}$ = number of staff and faculty that reside locally = 410

from survey results (see model B-1.1.2.1) 97.94% of the staff and faculty reside locally. This proportion was then applied to the total staff/faculty population of 419 giving a total of 410 staff/faculty that reside locally.

$(HSZ)_{FTS}$) = average household size of local, full-time students that do not live in group arrangements

= 2.80 (from survey results)

$(FTS)_{LR}$ = number of local, full-time students that do not live in group arrangements = 1,107

According to survey results 50 of the 106 full-time students met the requirements for $(FTS)_{LR}$. This proportion of 50/106 was the applied to the full-time student population ('87-'88) of 2,346.

(50/106) 2,346 = 1,107

$(GE)_{pc}$ = per capita state and local direct general expenditures (excluding intergovernmental expenditures) = $2,158*

* 1986 figure, Economic Indicators, West Virginia Research League, 1988.

$(CG)_{CR}$ = [$(HSZ)_{SF}$ $(SF)_{LR}$ $(GE)_{pc}$]

+ [$(HSZ)_{FTS}$ $(FTS)_{LR}$ $(GE)_{pc}$]

= [(2.5979) (410) ($2,158)]

+

[(2.80) (1,107) ($2,158)]

= $2,298,570 + $6,688,937

= $8,987,507

Model I-1

J_L

Number of Local Jobs Attributable to the Presence of the College

F = total number of faculty and staff = 419

j = full-time jobs per dollar of direct expenditures

= 0.00009 man-years of employment /$1.00 of expenditures by local residents in local business establishments (from Caffrey Isaacs methodology).

$(E_L)_{CR}$ = college-related local expenditures (model B-1.1) = $1,654,800

$(CG)_{CR}$ = costs of government-provided services allocable to college-related influences = $8,987,507

J_L = F + (j) [$(E_L)_{CR}$ + $(CG)_{CR}$]

419 + 0.0009 [$1,654,800 + $8,987,507]

= 419 + 0.0009 [$10,642,307]

= 419 + 958 = 1,377

Model I-2

PI_{CR}

Personal Income of Local Individuals from College-Related Jobs

f_L = proportion of faculty and staff residing locally (see model B-1.1.2.1)

= 0.9794

W_F = gross compensation to faculty and staff

= $8,669,867

From Caffrey Isaacs:

p = payrolls and profits per dollar of local direct expenditures

= $0.66/$1.00 expenditure by local residents in local business establishments

$(E_L)_{CR}$ = college-related local expenditures (model B-1.1)

= $1,654,800

$PI_{CR} = (f_L)\ (W_F) + (p)\ (E_L)_{CR}$

= (0.9794) ($8,669,867)

+ (0.66) ($1,654,800)

= $8,491,268 + $1,092,168

= $9,583,436

Model I-3

DG_R

Durable Goods Procured with Income from College-Related Jobs + Business Activities

$$DG_{CR} = (i)\ (PI_{CR})$$

i = proportion of total income typically used to purchase durable goods (from Caffrey-Isaacs model)

= 0.03

PI_{CR} = personal income of local individuals from college-related jobs and business activities (model I-2)

= $9,583,436

DG_{CR} = (0.03) ($9,583,436)

= $287,503

PART III - CONDUCTING THE SURVEY

As could be seen in the examples of model calculations, much of the information necessary for the calculations must come from survey results. West Virginia State College sent surveys to all its employees and half of its student body (about 2,200 students). Since the WVSC study made no claims about the statistical significance of their survey results and were only interested in reasonable estimates, sample size was not a great concern.

The WVSC survey instrument was accompanied by a letter from the president explaining its purpose and asking for the addressee's assistance. The data entry requirement of this instrument was completed by one person working about one week. The data entry was done on an IBM - PC (70 model) as was the SAS data analysis.

The WVSC survey instrument and its codes are provided as an example. Note that its simplicity allows the study to stay in the realm of a one-person endeavor.

WEST VIRGINIA STATE COLLEGE
ECONOMIC IMPACT ON KANAWHA VALLEY

The questions on this survey are designed to collect information about the economic impact of WVSC on the local economy. Please complete the questions and return the survey to Ms. Pamela S. Sturm, Director of Institutional Research and Grants, Campus Box 180. Please return no later than April 14 1989. To insure confidentiality, do not write your name on the questionaire. Thank you for your help.

(1) What is your college status? (Check the category representing your primary status at the college.)

_____ Faculty _____Staff _____Full-time Student _____Part-time Student

(2) What is your marital status?

_____ Single, Widowed, Divorced, Separated? _____Married?

(3) How many persons are in your household? _____

How many are children? _____. How many children attend public schools?____

(4) Where is your college residence? _____On campus. _____Off campus.

(5) If off campus, in what county do you reside?_____

(6) In what type housing do you reside? Check one.

_____ College Dormitory. _____Rent with other students. _____Rent.

_____ Own Home. _____ Live with parents.

(7) Does your housing expenditure include substantially all board (meals)?

_____ Yes. _____ No.

a. If you answered yes, please estimate your average monthly expenditures in the following categories:

Room and board $_____ Other food expenditures $_____

All other nonhousing expenditures $_____

b: If you answer no, please estimate your average monthly expenditures in the following categories:

Housing expenses $_____, Food expenses $_____, All other expenses $_____

(8) What is the total annual income of all persons in your household before payroll deductions? $_____, After payroll deductions? $_____

(9) What is your approximate monthly expenditure in business establishments in the Kanawha valley (Counties of Kanawha, Putnam and adjoining portions of Lincoln, Boone, Clay, Roane and Jackson? $_____.

10) What are your average balances in the following categories (see your monthly statement from your financial institution)?

Checking accounts $_____ and Savings account $_____.

Economic Impact Study
Survey Codes:

(1) College Status
- Faculty = 1
- Staff = 2
- Full-Time Student = 3
- Part-Time Student = 4

(2) Marital Status
- Single, Widowed, Divorced Separated = 1
- Married = 2

(3) Household Size = _____
Children = _____
Children in Public Schools = _____

(4) College Residence
- On Campus = 1
- Off Campus = 2

(5) County (use attached codes)

(6) Housing Type
- College Dorm = 1
- Rent w/other Students = 2
- Rent = 3
- Live w/Parents = 4
- Own Home = 5

(7) Board
- Yes = Y
- No = N

a. Room/Board _____
Other Food Expenditures _____
Non-housing Expenditures _____

b. Housing Expenses _____
Food Expenses _____
All Other Expenses _____

(8) Annual Income

Before Payroll Deductions _____
After Payroll Deductions _____

(9) Monthly Local Business Expenditures _____

(10) Checking Account Balance _____
Savings Account Balance _____

W. VA. County Codes

01 Barbour
02 Berkley
03 Boone
04 Braxton
05 Brooke
06 Cabell
07 Calhoun
08 Clay
09 Doddridge
10 Fayette
11 Gilmer
12 Grant
13 Greenbrier
14 Hampshire
15 Hancock
16 Hardy
17 Harrison
18 Jackson
19 Jefferson
20 Kanawha
21 Lewis
22 Lincoln
23 Logan
24 Marion
25 Marshall
26 Mason
27 McDowell
28 Mercer
29 Mineral
30 Mingo
31 Monongalia
32 Monroe
33 Morgan
34 Nicholas
35 Ohio
36 Pendleton
37 Pleasants
38 Pocahontas
39 Preston
40 Putnam
41 Raleigh
42 Randolph
43 Ritchie
44 Roane
45 Summers
46 Taylor
47 Tucker
48 Tyler
49 Upshur
50 Wayne
51 Webster
52 Wetzel
53 Wirt
54 Wood
55 Wyoming

PART - IV DATA ANALYSIS

The SAS - PC programming used to analyze the WVSC data are provided in this section as a guide. Again, simplicity is emphasized to ensure expedient completion of the study. The first program analyzed the staff and faculty data; the second analyzed the student data.

```
NOTE: Copyright(c) 1985,86,87 SAS Institute Inc., Cary, NC 27512-8000, U.S.A.
NOTE: SAS (r) Proprietary Software Release 6.03
      Licensed to WVNET, Site 03911001.

NOTE: Additional user information:
      Steve W. Batson
      61

NOTE: AUTOEXEC processing completed.

     1    DATA UNIVERSE;
     2    INPUT CS 1 MS 2 HSZ 3-4 CH 5-6 CHPS 7-8 CRES 9 CNTY 10-11 HOUS 12
     3    BRD $ 13 RMBR 14-17 FD 18-20 NH 21-24 HSEX 25-28 FDEX 29-31
     4    ALEX 32-35 AID 36-41 AIA 42-47 LEX 48-51 CK 52-57 SV 58-63;
     5    CARDS;
   301    DATA ALLSF; SET UNIVERSE; IF CS=1 OR CS=2;
NOTE: The data set WORK.UNIVERSE has 295 observations and 20 variables.
NOTE: The DATA statement used 19.00 seconds.
   302    PROC MEANS; VAR HSZ CH CHPS
NOTE: The data set WORK.ALLSF has 97 observations and 20 variables.
NOTE: The DATA statement used 11.00 seconds.
   303    RMBR FD NH HSEX FDEX ALEX AID AIA LEX CK SV;
   304    TITLE 'MEANS FOR ALL FACULTY AND STAFF'; RUN;
NOTE: The PROCEDURE MEANS used 13.00 seconds.
   305    DATA SF; SET ALLSF;
   306    IF CNTY=3 OR CNTY=8 OR CNTY=18 OR CNTY=20 OR CNTY=22
   307    OR CNTY=40 OR CNTY=44;
   308    PROC MEANS; VAR HSZ CH CHPS
NOTE: The data set WORK.SF has 95 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
   309    RMBR FD NH HSEX FDEX ALEX AID AIA LEX CK SV;
   310    TITLE 'MEANS FOR LOCAL FACULTY AND STAFF'; RUN;
NOTE: The PROCEDURE MEANS used 11.00 seconds.
   311    DATA SFRENT; SET SF;
   312    IF HOUS=3;
   313    PROC MEANS; VAR HSZ CH CHPS
NOTE: The data set WORK.SFRENT has 24 observations and 20 variables.
NOTE: The DATA statement used 9.00 seconds.
   314    RMBR FD NH HSEX FDEX ALEX AID AIA LEX CK SV;
   315    TITLE 'MEANS FOR LOCAL FACULTY AND STAFF THAT RENT';
   316    RUN; OPTIONS PAGESIZE=80;
NOTE: The PROCEDURE MEANS used 10.00 seconds.
```

```
NOTE: Copyright(c) 1985,86,87 SAS Institute Inc., Cary, NC 27512-8000, U.S.A.
NOTE: SAS (r) Proprietary Software Release 6.03
      Licensed to WVNET, Site 03911001.

NOTE: Additional user information:
      Steve W. Batson
      61

NOTE: AUTOEXEC processing completed.

     1    DATA UNIVERSE;
     2    INPUT CS 1 MS 2 HSZ 3-4 CH 5-6 CHPS 7-8 CRES 9 CNTY 10-11 HOUS 12
     3    BRD $ 13 RMBR 14-17 FD 18-20 NH 21-24 HSEX 25-28 FDEX 29-31
     4    ALEX 32-35 AID 36-41 AIA 42-47 LEX 48-51 CK 52-57 SV 58-63;
     5    CARDS;
   301    DATA ALLSTDNS; SET UNIVERSE; IF CS=3 OR CS=4;
NOTE: The data set WORK.UNIVERSE has 295 observations and 20 variables.
NOTE: The DATA statement used 19.00 seconds.
   302    PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.ALLSTDNS has 198 observations and 20 variables.
NOTE: The DATA statement used 12.00 seconds.
   303    CK SV; TITLE 'MEANS FOR ALL STUDENTS'; RUN;
NOTE: The PROCEDURE MEANS used 15.00 seconds.
   304    DATA FTSTDNS; SET ALLSTDNS; IF CS=3;
   305    PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.FTSTDNS has 106 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
   306    CK SV; TITLE 'MEANS FOR FULL-TIME STUDENTS'; RUN;
NOTE: The PROCEDURE MEANS used 11.00 seconds.
   307    DATA PTSTDNS; SET ALLSTDNS; IF CS=4;
   308    PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.PTSTDNS has 92 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
   309    CK SV; TITLE 'MEANS FOR PART-TIME STUDENTS'; RUN;
NOTE: The PROCEDURE MEANS used 12.00 seconds.
   310    DATA DORMSTDN; SET ALLSTDNS; IF HOUS=1;
   311    PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.DORMSTDN has 8 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
   312    CK SV; TITLE 'MEANS FOR DORM STUDENTS'; RUN;
NOTE: The PROCEDURE MEANS used 9.00 seconds.
   313    DATA RENTWOS; SET ALLSTDNS; IF HOUS=2;
   314    PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.RENTWOS has 1 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
   315    CK SV; TITLE 'MEANS FOR STUDENTS THAT RENT WITH OTHER STUDENTS';
   316    RUN;
NOTE: The PROCEDURE MEANS used 9.00 seconds.
   317    DATA FENTWOS; SET ALLSTDNS; IF HOUS=2 AND CS=3;
   318    PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.FENTWOS has 1 observations and 20 variables.
NOTE: The DATA statement used 9.00 seconds.
   319    CK SV; TITLE1 'MEANS FOR STUDENTS THAT RENT WITH OTHER STUDENTS';
   320    TITLE2 'AND ARE FULL-TIME STUDENTS'; RUN;
NOTE: The PROCEDURE MEANS used 10.00 seconds.
   321    DATA PENTWOS; SET ALLSTDNS; IF HOUS=2 AND CS=4;
   322    PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.PENTWOS has 0 observations and 20 variables.
NOTE: The DATA statement used 9.00 seconds.
   323    CK SV; TITLE1 'MEANS FOR STUDENTS THAT RENT WITH OTHER STUDENTS';
   324    TITLE2 'AND ARE PART-TIME STUDENTS'; RUN;
WARNING: No observations in data set WORK.PENTWOS.
NOTE: The PROCEDURE MEANS used 9.00 seconds.
   325    DATA HOMEFS; SET ALLSTDNS; IF HOUS=4 AND CS=3;
```

```
NOTE: The data set WORK.HOMEFS has 21 observations and 20 variables.
NOTE: The DATA statement used 9.00 seconds.
  327     CK SV; TITLE1 'MEANS FOR FULL-TIME STUDENTS THAT OWN THEIR HOME';
  328     RUN;
NOTE: The PROCEDURE MEANS used 9.00 seconds.
  329     DATA HOMEPS; SET ALLSTDNS; IF HOUS=4 AND CS=4;
  330     PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.HOMEPS has 49 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
  331     CK SV; TITLE1 'MEANS FOR PART-TIME STUDENTS THAT OWN THEIR HOME';
  332     RUN;
NOTE: The PROCEDURE MEANS used 11.00 seconds.
  333     DATA LVWPFS; SET ALLSTDNS; IF HOUS=5 AND CS=3;
  334     PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.LVWPFS has 47 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
  335     CK SV; TITLE1 'MEANS FOR FULL-TIME STUDENTS THAT LIVE WITH';
  336     TITLE2 'THEIR PARENTS';
  337     RUN;
NOTE: The PROCEDURE MEANS used 11.00 seconds.
  338     DATA LVWPPS; SET ALLSTDNS; IF HOUS=5 AND CS=4;
  339     PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.LVWPPS has 13 observations and 20 variables.
NOTE: The DATA statement used 9.00 seconds.
  340     CK SV; TITLE1 'MEANS FOR PART-TIME STUDENTS THAT LIVE WITH';
  341     TITLE2 'THEIR PARENTS';
  342     RUN;
NOTE: The PROCEDURE MEANS used 11.00 seconds.
  343     DATA BEMS; SET ALLSTDNS; IF CS=3 AND (HOUS=1 OR HOUS=2 OR HOUS=5);
  344     PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.BEMS has 56 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
  345     CK SV; TITLE1 'MEANS FOR FULL-TIME STUDENTS THAT LIVE IN';
  346     TITLE2 'GROUP ARRANGEMENTS';
  347     RUN;
NOTE: The PROCEDURE MEANS used 12.00 seconds.
  348     DATA BENHS; SET ALLSTDNS; IF CS=3 AND HOUS=3;
  349     PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.BENHS has 29 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
  350     CK SV; TITLE1 'MEANS FOR FULL-TIME STUDENTS THAT RENT';
  351     RUN;
NOTE: The PROCEDURE MEANS used 11.00 seconds.
  352     DATA LFTRO; SET ALLSTDNS; IF CS=3 AND (HOUS=3 OR HOUS=4);
  353     PROC MEANS; VAR HSZ CH CHPS RMBR FD NH HSEX FDEX ALEX AID AIA LEX
NOTE: The data set WORK.LFTRO has 50 observations and 20 variables.
NOTE: The DATA statement used 10.00 seconds.
  354     CK SV; TITLE1 'MEANS FOR FULL-TIME STUDENTS THAT RENT OR OWN';
  355     TITLE2 'THEIR OWN HOME';
  356     RUN;
NOTE: The PROCEDURE MEANS used 12.00 seconds.
```

```
DATA DIRECT;
FORMAT EXPEND DOLLAR10.0;
INPUT SOURCE $ 1-19 EXPEND 20-30;
CARDS;
COLLEGE             1678486
FACULTY & STAFF     7163356
STUDENTS            2642940
VISITORS            1654800

OPTIONS DEVICE=PROPRINT;
PROC GCHART;
PIE SOURCE / TYPE=SUM SUMVAR=EXPEND PERCENT=INSIDE;
TITLE4 'DIRECT EXPENDITURES BY SOURCE';
FOOTNOTE;
RUN;
DATA INDIRECT;
FORMAT EXPEND DOLLAR15.0;
INPUT SOURCE $ 1-25 EXPEND 30-40;
CARDS;
2ND ROUND PURCH               3941874
BUSINESS VOLUME               10511666

OPTIONS DEVICE=PROPRINT;
PROC GCHART;
PIE SOURCE / TYPE=SUM SUMVAR=EXPEND PERCENT=INSIDE;
TITLE4 'INDIRECT EXPENDITURES BY SOURCE';
FOOTNOTE1 'BUSINESS VOLUME REPRESENTS LOCAL BUSINESS VOLUME ';
FOOTNOTE2 'STIMULATED BY THE EXPENDITURE OF WVSC-RELATED INCOME';
FOOTNOTE3 'BY LOCAL INDIVIDUALS OTHER THAN WVSC EMPLOYEES.';
FOOTNOTE4 '2ND ROUND PURCH REPRESENTS PURCHASES FROM LOCAL';
FOOTNOTE5 'SOURCES BY LOCAL BUSINESSES IN SUPPORT OF THEIR';
FOOTNOTE6 'WVSC-RELATED BUSINESS VOLUME.';
RUN;
DATA TOTAL;
FORMAT EXPEND DOLLAR15.0;
INPUT SOURCE $ 1-25 EXPEND 30-40;
CARDS;
COLLEGE                       1678486
FACULTY & STAFF               7163356
STUDENTS                      2642940
VISITORS                      1654800
2ND ROUND PURCH               3941874
BUSINESS VOLUME               10511666

OPTIONS DEVICE=PROPRINT;
PROC GCHART;
PIE SOURCE / TYPE=SUM SUMVAR=EXPEND PERCENT=INSIDE;
TITLE4 'TOTAL MONETARY IMPACT BY SOURCE';
RUN;
```

VARIABLE DEFINITIONS

HSZ = HOUSEHOLD SIZE

CH = CHILDREN

CHPS = CHILDREN IN PUBLIC SCHOOLS

RMBR = ROOM/BOARD COSTS (MONTHLY)

FD = FOOD EXPENDITURE (MONTHLY FOR BOARD)

NH = NON-HOUSING EXPENDITURES (MONTHLY)

HSEX = HOUSING EXPENDITURES (MONTHLY)

FDEX = FOOD EXPENDITURE (MONTHLY FOR NON-BOARD)

ALEX = ALL OTHER EXPENDITURES (MONTHLY FOR NON-BOARD)

AID = ANNUAL INCOME BEFORE DEDUCTIONS

AIA = ANNUAL INCOME AFTER DEDUCTIONS

LEX = EXPENDITURES IN LOCAL BUSINESS ESTABLISHMENTS (MONTHLY)

CK = MONTHLY AVERAGE AMOUNT IN CHECKING ACCOUNT

SV = MONTHLY AVERAGE AMOUNT IN SAVINGS ACCOUNT

PART V - WRITING THE FINAL REPORT

The first section of the final report should contain an introduction, a summary of major findings (see WVSC example contained in this section), and a discussion of the major findings. The second section should contain a detailed discussion of the methodology, model and actual model calculations. The third, and final section should contain the survey instrument and the data analysis.

The distribution of the final report is made only to the president and major college administrators. Other individuals are provided copies only upon request.

A less bulky report (or brochure) is used for wider distribution and public relations purposes. This report should be brief and contain an introduction, summary of findings, and a short discussion of the findings. Charts, such as a pie chart indicating the sources of the total monetary impact, are nice P-R additions. An example of a PC SAS/GRAPH program and the charts it generates are provided in this section.

SUMMARY OF FINDINGS

TOTAL MONETARY IMPACT ON THE ECONOMY	$27,593,122

****

COMPONENTS

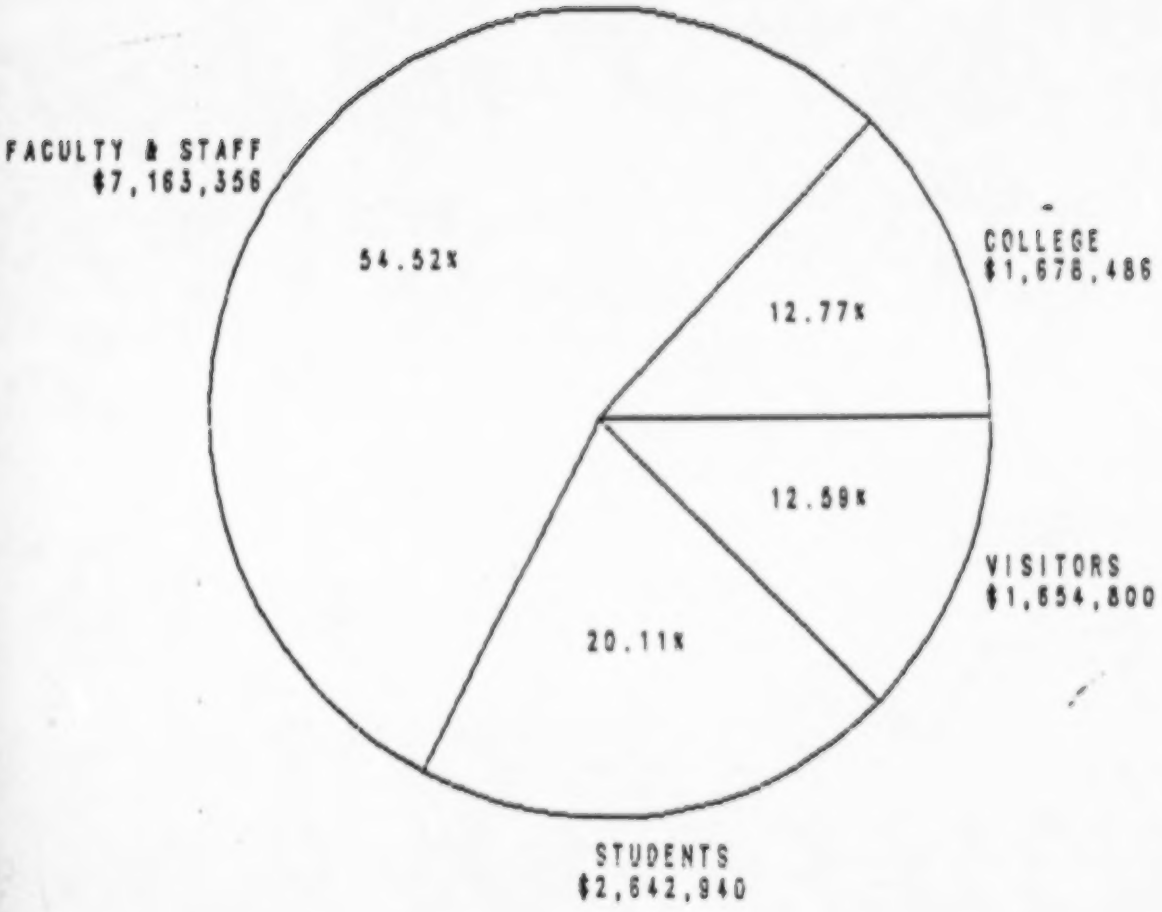
1.	DIRECT LOCAL EXPENDITURES		$13,139,582
	A. WEST VIRGINIA STATE COLLEGE	$ 1,678,486	
	B. WVSC FACULTY AND STAFF	$ 7,163,356	
	C. WVSC STUDENTS	$ 2,642,940	
	D. WVSC VISITORS	$ 1,654,800	
2.	INDIRECT LOCAL EXPENDITURES		$14,453,540
	A. PURCHASES FROM LOCAL SOURCES BY LOCAL BUSINESSES IN SUPPORT OF THEIR WVSC-RELATED BUSINESS VOLUME	$ 3,941,874	
	B. LOCAL BUSINESS VOLUME STIMULATED BY THE EXPENDITURE OF WVSC-RELATED INCOME BY LOCAL INDIVIDUALS, OTHER THAN STAFF, FACULTY OR STUDENTS	$10,511,666	

****

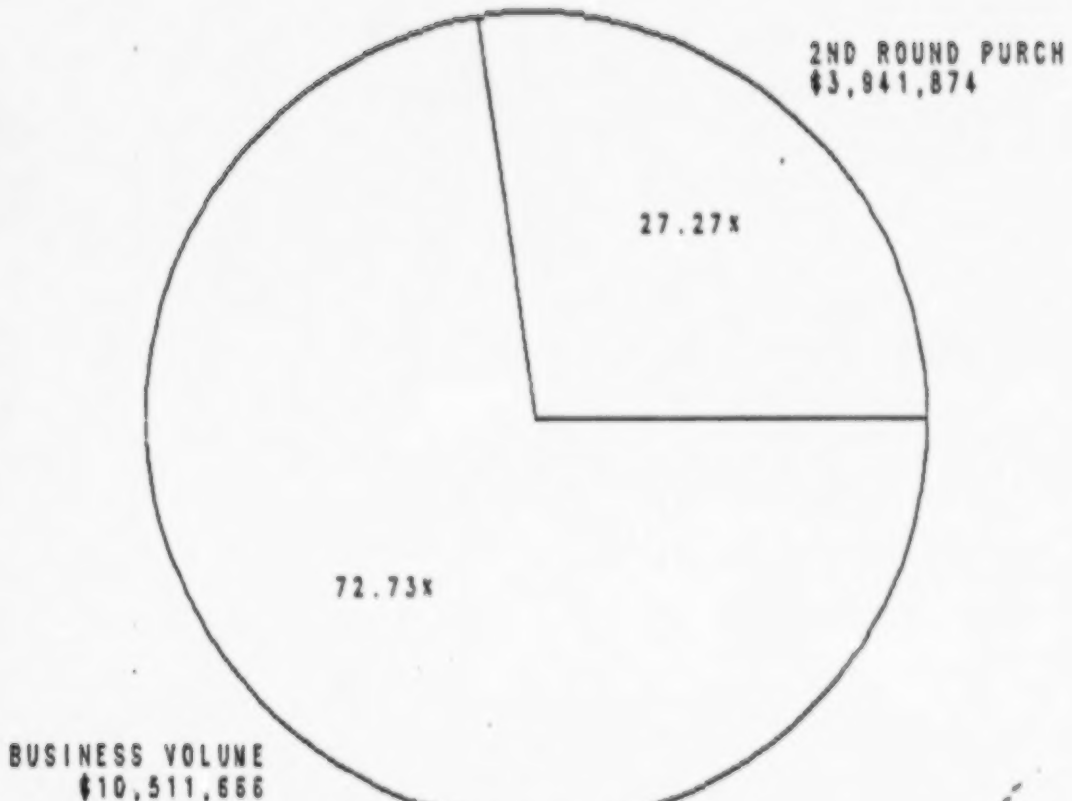
ADDITIONAL IMPACT

1.	EXPANSION OF THE LOCAL BANKS' CREDIT BASE RESULTING FROM COLLEGE-RELATED DEPOSITS	$ 4,658,307
2.	NUMBER OF JOBS CREATED	1,377
3.	PERSONAL INCOME OF LOCAL INDIVIDUALS FROM COLLEGE-RELATED JOBS AND BUSINESS ACTIVITIES	$ 9,583,436
4.	DURABLE GOODS PROCURED WITH INCOME FROM COLLEGE-RELATED JOBS AND BUSINESS ACTIVITIES	$ 287,503

DIRECT EXPENDITURES BY SOURCE
SUM of EXPEND by SOURCE

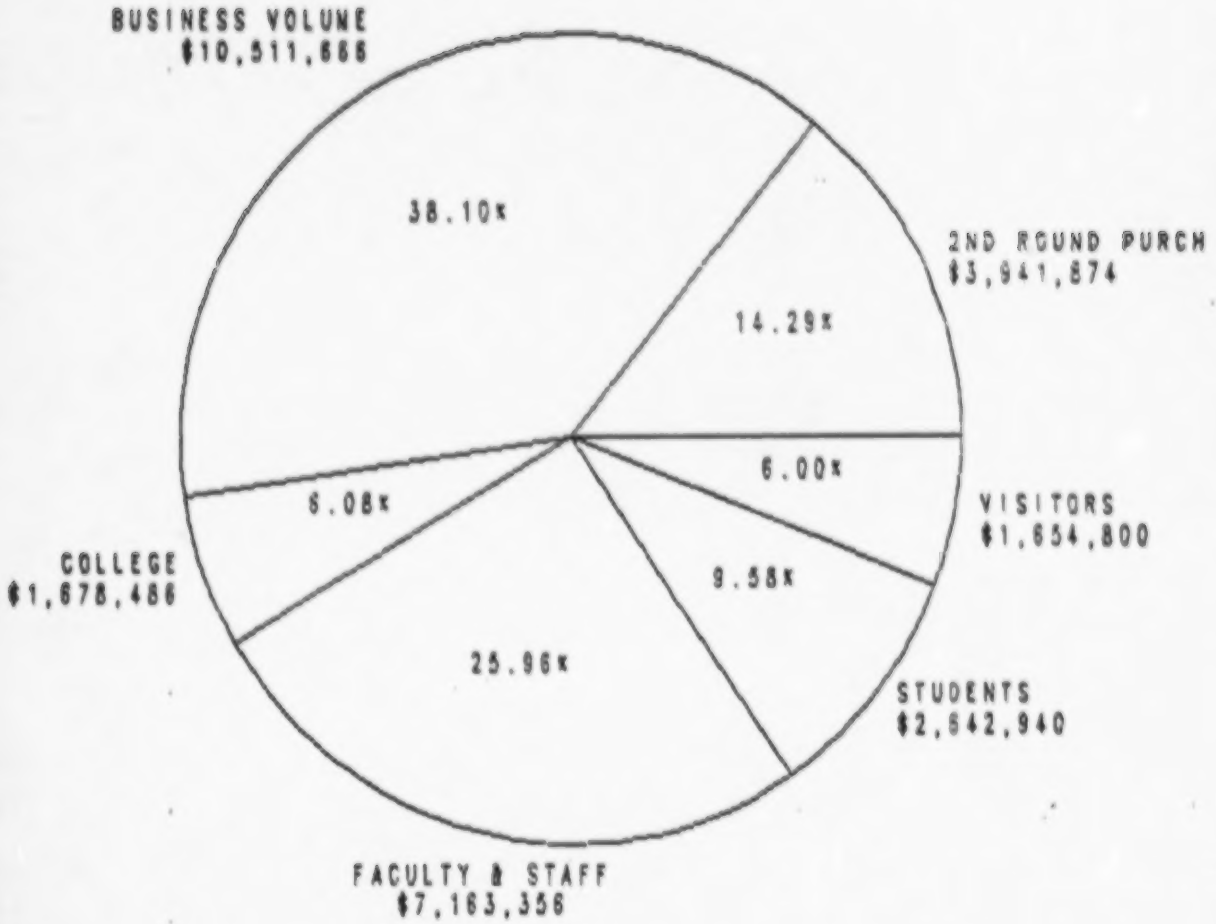


INDIRECT EXPENDITURES BY SOURCE
SUM of EXPEND by SOURCE



BUSINESS VOLUME REPRESENTS LOCAL BUSINESS VOLUME STIMULATED BY THE EXPENDITURE OF WVSC-RELATED INCOME BY LOCAL INDIVIDUALS OTHER THAN WVSC EMPLOYEES. 2ND ROUND PURCH REPRESENTS PURCHASES FROM LOCAL SOURCES BY LOCAL BUSINESSES IN SUPPORT OF THEIR WVSC-RELATED BUSINESS VOLUME.

TOTAL MONETARY IMPACT BY SOURCE
SUM of EXPEND by SOURCE



BUSINESS VOLUME REPRESENTS LOCAL BUSINESS VOLUME STIMULATED BY THE EXPENDITURE OF WVSC-RELATED INCOME BY LOCAL INDIVIDUALS OTHER THAN WVSC EMPLOYEES. 2ND ROUND PURCH REPRESENTS PURCHASES FROM LOCAL SOURCES BY LOCAL BUSINESSES IN SUPPORT OF THEIR WVSC-RELATED BUSINESS VOLUME.